



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/925,985	09/09/97	PATRICK	R P0318/LAM1P0

JOPSEPH A NGUYEN
HICKMAN AND BEYER
P O BOX 61059
PALO ALTO CA 94306

IM62/0301

EXAMINER

MARKOFF, A

ART UNIT

PAPER NUMBER

1746

DATE MAILED:

03/01/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

08/925,985

Applicant(s)

PATRICK ET AL.

Examiner

Alexander Markoff

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- 1) ☒ Responsive to communication(s) filed on 04 January 2000.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 11-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-10 and 25-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some * c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☐ received.
2. ☐ received in Application No. (Series Code / Serial Number) _____.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- 14) ☒ Notice of References Cited (PTO-892)
- 15) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 16) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 17) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 18) ☐ Notice of Informal Patent Application (PTO-152)
- 19) ☐ Other: _____

Art Unit: 1746

DETAILED ACTION

Election/Restrictions

1. Claims 11-24 stand withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 4.

The Examiner, in the previous Office Action, required restriction to one of the two inventions (Group I – claims 1-10 and Group II – claims 11-24.

The Applicants failed to affirm or traverse the restriction requirement. The Applicants instead submitted new claims, which they numbered as 11-21. (These newly submitted claims were renumbered as 25-35.)

Since no attempt was made to traverse the restriction requirement the election is treated as made without traverse.

If the Applicants intention was to cancel non-elected claims 11-24, they have to submit a proper amendment, requiring cancellation. Submitting new claims having the same numbers as non-elected claims is not proper.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 33-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Art Unit: 1746

Claim 33 is indefinite because the term "snugly fit" is relative in nature lacking proper comparative basis.

Claims 34 and 35 are indefinite because it is not clear what is meant under "a preferential injection pattern to further improve etch uniformity". It is not clear what is referenced as a "preferential pattern" and "further" to what the etch uniformity should be improved.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

5. Claims 1-3, 7-10 25 and 29-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Wicker et al (US Patent No 5,993,594).

Wicker et al teach a method for etching comprising treating semiconductor substrates by a plasma generated from an etching source gas with the use of a sacrificial substrate holder (14) in the same etching chamber as the Applicants (Transformer Coupled Plasma processing system, TCP™ of Lam Research Corporation). The chamber is provided with a gas distribution plate (showerhead) having an injection pattern designed to improve etch uniformity (column 3, lines 16-18). The substrate holder (14) is a ring having a planar upper surface, which is even with

Art Unit: 1746

surface of the substrate, and is dimensioned to fit the substrate. The substrate holder (14) is etched simultaneously with the substrate. The by-products of such etching are volatile.

The substrate during the etching is in contact with a chuck employing helium cooling.

Wicker et al teach the substrate holder made of a material comprising aluminum (column 6, lines 34-50).

Wicker et al do not specifically state that a plasma cloud, which is created in the chamber, extends beyond an outer periphery of the substrate holder. 25

However, since the size of the plasma cloud in Wicker et al and it's relation to the size of the substrate holder (chuck 12) is determined by the construction of the chamber and since the Wicker et al use the same chamber (TCP™ of Lam Research Corporation) as the Applicants it is inherent that the size of the plasma cloud would be inherently the same.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1746

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 4-6 and 26-28 rejected under 35 U.S.C. 103(a) as being unpatentable over by Wicker et al (US Patent No 5,993,594) in view of any one of Abraham (US Patent NO 5,772,906) and Abraham et al (US Patent No 5,952,244).

Wicker et al teach a method for etching comprising treating semiconductor substrates by a plasma generated from an etching source gas with the use of a sacrificial substrate holder (14) in the same etching chamber as the Applicants (Transformer Coupled Plasma processing system, TCP™ of Lam Research

Art Unit: 1746

Corporation). The chamber is provided with a gas distribution plate (showerhead) having an injection pattern designed to improve etch uniformity (column 3, lines 16-18). The substrate holder (14) is a ring having a planar upper surface, which is even with surface of the substrate, and is dimensioned to fit the substrate. The substrate holder (14) is etched simultaneously with the substrate. The by-products of such etching are volatile.

The substrate during the etching is in contact with a chuck employing helium cooling.

Wicker et al teach the substrate holder made of a material comprising aluminum (column 6, lines 34-50).

Wicker et al do not specifically state that a plasma cloud, which is created in the chamber, extends beyond an outer periphery of the substrate holder.

However, since the size of the plasma cloud in Wicker et al and it's relation to the size of the substrate holder (chuck 12) is determined by the construction of the chamber and since the Wicker et al use the same chamber (TCP™ of Lam Research Corporation) as the Applicants it is inherent that the size of the plasma cloud would be inherently the same.

Wicker et al do not specifically teach the use of their method in a process of etching aluminum using a gas containing chlorine. They disclose their method with respect to an oxide etch.

Art Unit: 1746

However, it was known in the art that the etching chamber used by Wicker et al chamber (TCP™ of Lam Research Corporation) can be used to perform aluminum etching using chlorine containing gases as evidenced by Abraham and Abraham et al.

Accordingly, it would have been obvious to an ordinary artisan at the time the invention was made to extend the etching method of Wicker et al, which utilizes a focus ring which reduces contamination, on the other etching process which can be conventionally conducted using the same equipment in order to reduce contamination.

Response to Arguments

10. Applicant's arguments with respect to claims 1-10 and 25-35 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 1746

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Markoff whose telephone number is 703-308-7545. The examiner can normally be reached on Monday - Friday 8:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on 703-308-4333. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7719 for regular communications and 703-305-7718 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0651.



Alexander Markoff
Art Unit 1746

am
February 25, 2000